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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/604,449	07/22/2003	Maresh Raman Narayanaswamy	132061 (GEMS 0199 PA)	1448
27256	7590	05/27/2005	EXAMINER	
ARTZ & ARTZ, P.C. 28333 TELEGRAPH RD. SUITE 250 SOUTHFIELD, MI 48034			THOMAS, COURTNEY D	
			ART UNIT	PAPER NUMBER
			2882	

DATE MAILED: 05/27/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/604,449

Applicant(s)

NARAYANASWAMY ET AL.

Examiner

Courtney Thomas

Art Unit

2882

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 22 July 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 July 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 07/22/03.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Claim Rejections - 35 USC § 112***

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claim 9 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In particular, Claim 9 recites a circuit wherein the flexible detector transmission circuit *is formed* using a heat and pressure method. The limitation is objected to as **a)** a hybrid claim wherein subject matter is directed to a product, but defined by a method of making (see MPEP 705.01 (e)) and **b)** representing a product by process claim (MPEP 2113). Examiner concludes that the recited limitation fails to further define the claimed transmission circuit (see MPEP 608.01(m)) and is therefore considered ambiguous.

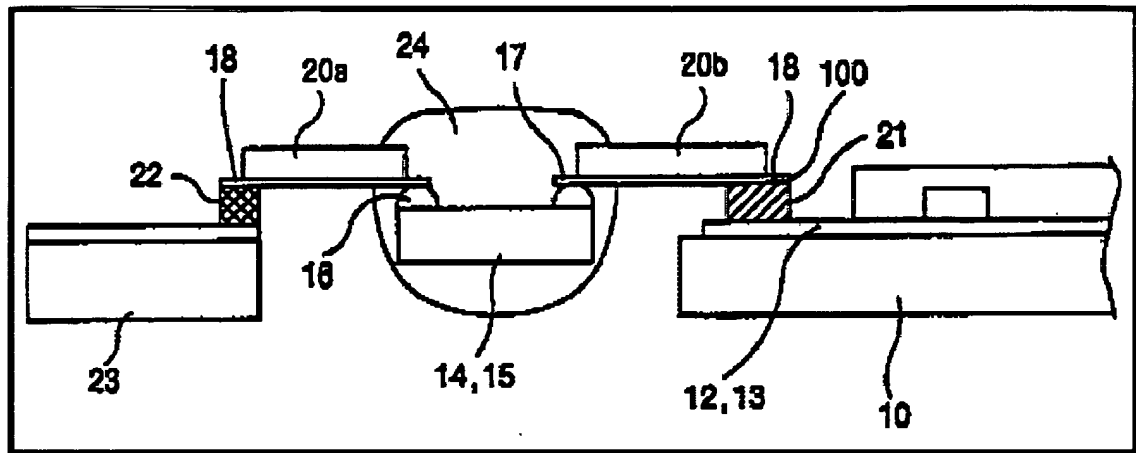
### ***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

4. Claims 1-6, 8 and 10-13 are rejected under 35 U.S.C. 102(a) as being anticipated by Kim (U.S. Patent 6,475,824).



5.

Figure 1 – X-ray detector (sectional view) - U.S. Patent 6,475,824 to Kim

6. As per claims 1, and 10-13, Kim discloses a flexible detector array transmission circuit comprising: a) at least one mono-directional conductive layer (21, 22) electrically coupled to at least one detector (10); b) at least one electrically conductive substrate layer (12, 13) electrically coupled to the at least one detector and c) a plurality of flexible circuit layers (100 - column 4, lines 22-29) electrically coupled to the at least one mono-directional conductive layer, the plurality of circuit layers directing X-ray signals generated by the detector to a data acquisition system (14, 15, 23, 25 - column 5, lines 53-61). Examiner notes that electrical conductive layer (12, 13) serves as a rigid support for the aligning and bonding of electrical connections between the detector and flexible circuit layer.

7. As per claim 2, Kim discloses a transmission circuit further comprising at least one insulation layer (20) disposed between the plurality of flexible circuit layers.

8. As per claims 3 and 4, Kim discloses a transmission circuit further comprising a plurality of detector bonding pads and circuit bonding pads electrically coupled to the at least one mono-directional layer (Fig. 2 above; column 5, lines 20-46).

Art Unit: 2882

9. **As per claim 5**, Kim discloses a transmission circuit further comprising circuit bonding pads (16), a plurality of electrical via (24) coupling the plurality of circuit bonding pads and the at least one mono-directional conductive layer, wherein the circuit layers comprise a first circuit layer and second circuit layer (see left-right portions, Fig. 2 shown above).

10. **As per claims 6 and 8**, Kim discloses a transmission circuit wherein the plurality of flexible circuit layers comprise a plurality of parallel fine line connections (column 4, lines 22-29).

***Claim Rejections - 35 USC § 103***

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

12. Claims 7 and 14-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kim (U.S. Patent 6,475,824) in view of Hoffman (U.S. Patent 6,859,514).

13. **As per claim 7**, Kim discloses a transmission circuit as recited in claim 1 but does not explicitly disclose the at least one detector as being a back-lit diode.

14. Hoffman teaches X-ray detector configurations comprising backlit photodiodes. Hoffman teaches that backlit photodiodes are commonly used in CT detectors primarily for their tile-ability and improved interconnectivity over traditional photodiodes (column 2, lines 11-20).

15. It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the transmission circuit of Kim such that the detector incorporated backlit photodiodes. One would have been motivated to make such a modification for the

Art Unit: 2882

purpose of providing a detector with improved interconnectivity among diodes as taught by Hoffman (column 2, lines 11-20).

16. As per claim 14, Kim discloses a transmission circuit comprising: a) at least one mono-directional conductive layer (21, 22) electrically coupled to at least one detector (10) and b) a plurality of flexible circuit layers (100 - column 4, lines 22-29) electrically coupled to the at least one mono-directional conductive layer, the plurality of circuit layers directing X-ray signals generated by the detector to a data acquisition system (14, 15, 23, 25 - column 5, lines 53-61). Examiner notes that the disclosure of Kim is not only directed to a transmission circuit, but is also directed to an X-ray detector and its implied use in an X-ray imaging system. Kim does not explicitly disclose an X-ray system comprising an X-ray source and an image reconstructor.

17. Hoffman discloses an imaging system comprising an X-ray source (14) and image reconstructor (34). Hoffman teaches that the source provides penetrating radiation that is received by a corresponding detector (18) that converts sensed radiation into electrical signals and routed to an image constructor for image reconstruction of internal structure of an object of interest (column 1, lines 1-30).

18. It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Kim such that it incorporated an X-ray source and an image reconstructor. One would have been motivated to make such a modification for the purpose of providing penetrating radiation and using received signals to generate an image of the internal structure of an object of interest, as taught by Hoffman (column 1, lines 1-30).

Art Unit: 2882

19. **As per claim 15**, Kim as modified above, discloses a transmission circuit further comprising at least one insulation layer (20) disposed between the plurality of flexible circuit layers.

20. **As per claims 16 and 17**, Kim as modified above, discloses a transmission circuit further comprising a plurality of detector bonding pads and circuit bonding pads electrically coupled to the at least one mono-directional layer (Fig. 2 above; column 5, lines 20-46).

21. **As per claim 18**, Kim as modified above, discloses a transmission circuit further comprising circuit bonding pads (16), a plurality of electrical via (24) coupling the plurality of circuit bonding pads and the at least one mono-directional conductive layer, wherein the circuit layers comprise a first circuit layer and second circuit layer (see left-right portions, Fig. 2 shown above).

22. **As per claims 19 and 20**, Kim as modified above, discloses a transmission circuit wherein the plurality of flexible circuit layers comprise a plurality of parallel fine line connections (column 4, lines 22-29).

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Courtney Thomas whose telephone number is (571) 272-2496. The examiner can normally be reached on M - F (9 am - 5 pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ed Glick can be reached on (571) 272 2490. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 2882

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in cursive script that reads "Courtney Thomas".

Courtney Thomas  
Examiner  
Art Unit 2882